Ion Energization in the Auroral Zone: IMAGE/LENA Observations of low Altitude Heating Region Characteristics

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The LENA instrument on the IMAGE spacecraft measures low energy (10-300 eV) neutral atoms originating from, among other places, the auroral ionosphere. We use such observations made during perigee passes of the spacecraft, to determine the regional extent and the minimum altitude at which significant ion heating occurs. Multiple images taken over a few minutes interval (4-6) from a variety of different viewing perspectives allow us to determine the pitch angle distribution of the ions in the lowest altitude portion of the heating region. For this study we use twenty, southern hemisphere, perigee passes that occurred between the 10th and the 29th of June 2000. The dependence of ion heating region characteristics on magnetic activity and the variations in the composition of the ENA (O versus H) emissions will be discussed. Comparisons will be made with the results of a model that calculates the ENA emissions produced by heated auroral zone ions.